

***Rugitermes tinta*: A new termite (Isoptera, Kalotermitidae) from the Andean region of Colombia**

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Abstract

The imago and soldier castes of a new *Rugitermes* Holmgren, 1911 species, *R. tinta* **sp. nov.** are described. It is the ninth species of *Rugitermes* from South America and the first record of this genus from Colombia. Unlike its congeners, the soldier of *R. tinta* has very dark head capsule pigmentation and acute protuberances projecting from frontolateral ridges.

Keywords

frontolateral ridges, imago, new species, soldier, South America, taxonomy

Introduction

Rugitermes Holmgren, 1911 is a widespread termite genus in Central and South America (Scheffrahn 2019a) where twelve species are described (Krishna et al. 2013). A curious thirteenth species, *R. athertoni* (Light, 1932), occurs in Oceania. Eight species of *Rugitermes* are currently known from South America: *R. bicolor* (Emerson, 1925) from Amazonia (Scheffrahn 2019b), *R. laticollis* Snyder, 1957 from the Andean highlands (Scheffrahn 2015), *R. flavicinctus* (Emerson, 1925) and *R. magninotus* (Emerson, 1925) from Guyana, *R. niger* Oliveira, 1979, *R. nodulosus* (Hagen, 1858), and *R. rugosus* (Hagen, 1858)

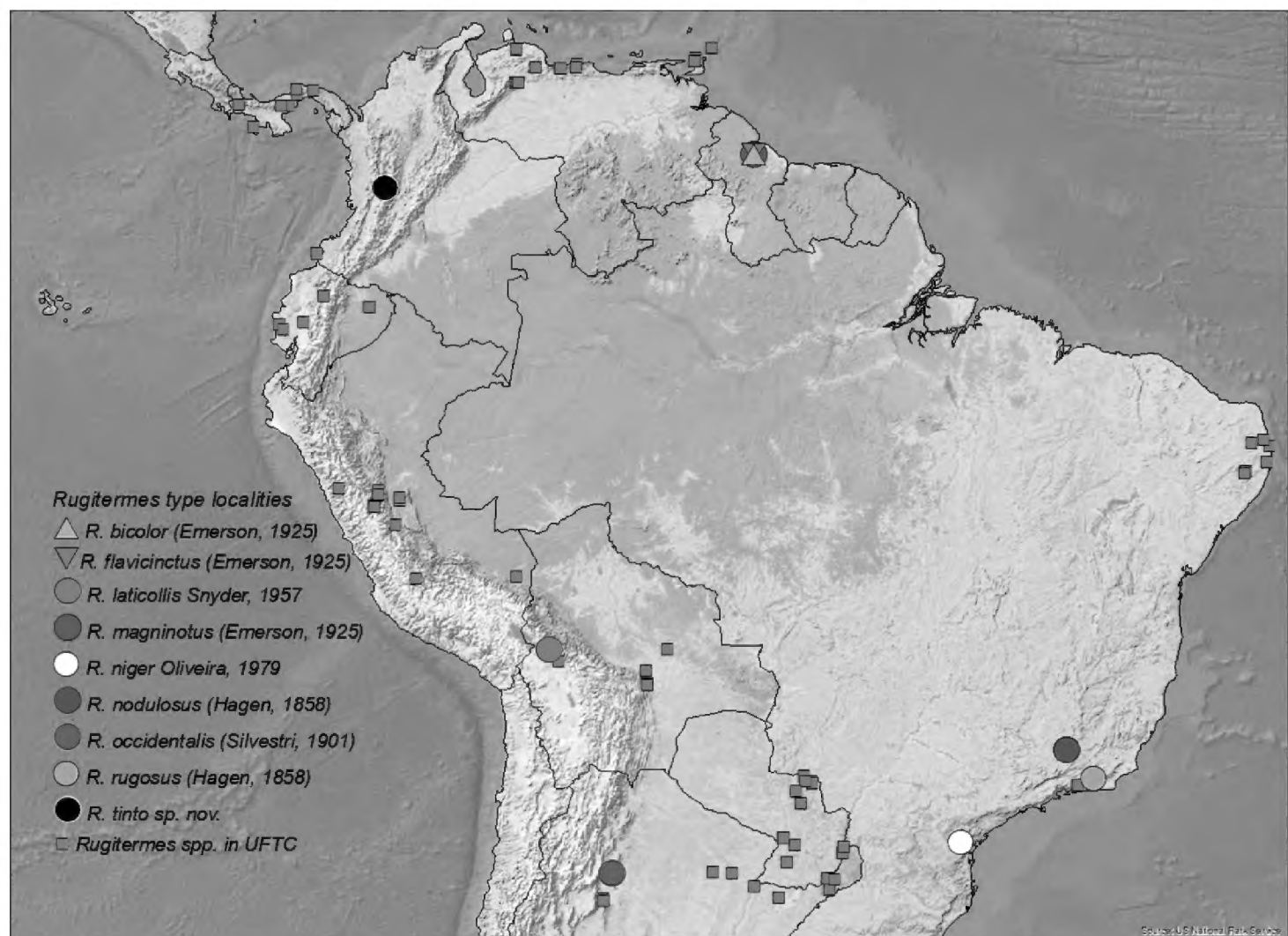


Figure 1. Type localities for all *Rugitermes* species described from South America and collection localities for *Rugitermes* spp. in the University of Florida Termite Collection (UFTC).

from southern Brazil, and *R. occidentalis* (Silvestri, 1901) from Argentina. The type localities for the South American species, including *Rugitermes tinto* sp. nov., are given in Fig. 1.

In South America, only four kalotermitid genera have soldiers with virtually no head capsule phragmosis: *Comatermes*, *Incisitermes*, *Neotermes*, and *Rugitermes* (Scheffrahn, 2019a). In his generic description, Krishna (1961) wrote that the *Rugitermes* soldier can be differentiated from the other three genera by the former's "prominent ridge...present in front of and medial to the antennal socket". The *Rugitermes* imago is distinguished by its "short, sclerotized median vein in the forewing which joins the radial sector very close to the wing suture" (Krishna 1961). The coloration of the head and pronotum contrast sharply in the majority of species.

Herein, we describe the imago and soldier of *Rugitermes tinto* sp. nov. This is the first record of *Rugitermes* from Colombia.

Material and methods

Microphotographs were taken as multi-layer montages using a Leica M205C stereomicroscope controlled by Leica Application Suite version 3 software. Preserved specimens were taken from 85 % ethanol and suspended in a pool of Purell Hand Sanitizer to position the specimens on a transparent Petri dish background.

Taxonomy

Rugitermes tinta Scheffrahn & Pinzón Florian, sp. nov.

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Figures 2, 3

Diagnosis. The soldier of *R. tinta* is the only non-phragmotid kalotermitid worldwide with dark coloration of the anterior head capsule. Aside from head color, it differs from congeneric soldiers in that the anterolateral corners of the frontal ridges project to form acute angles. In other South American (Fig. 4), Central American, and Oceanian *Rugitermes*, the anterolateral corners of the frontal ridges are either at right or obtuse angles.

Among South American species, the imago of *R. tinta*, with contrasting coloration of the head and pronotum, is similar to *R. bicolor*, *R. flavicinctus*, *R. magninotus*, and *R. nodulosus*. Of these, the imago of *R. bicolor* is larger, while that of *R. flavicinctus* is smaller than *R. tinta* and the head/pronotum coloration of the former two are similar to *R. magninotus*. The imago of *R. magninotus* has a brown head and a yellow pronotum while the imago of *R. tinta* has a black head and a brownish pronotum. The distribution of *R. nodulosus* is known only from southern Brazil (Minas Gerais).

Description. Imago (Fig. 2A, B). Single female damaged: distal half of left wings torn, right wings absent. Head capsule black; pronotum brownish orange. Compound eye small, nearly circular. Ocellus very small, circular, black; difficult to see as there is no contrast with

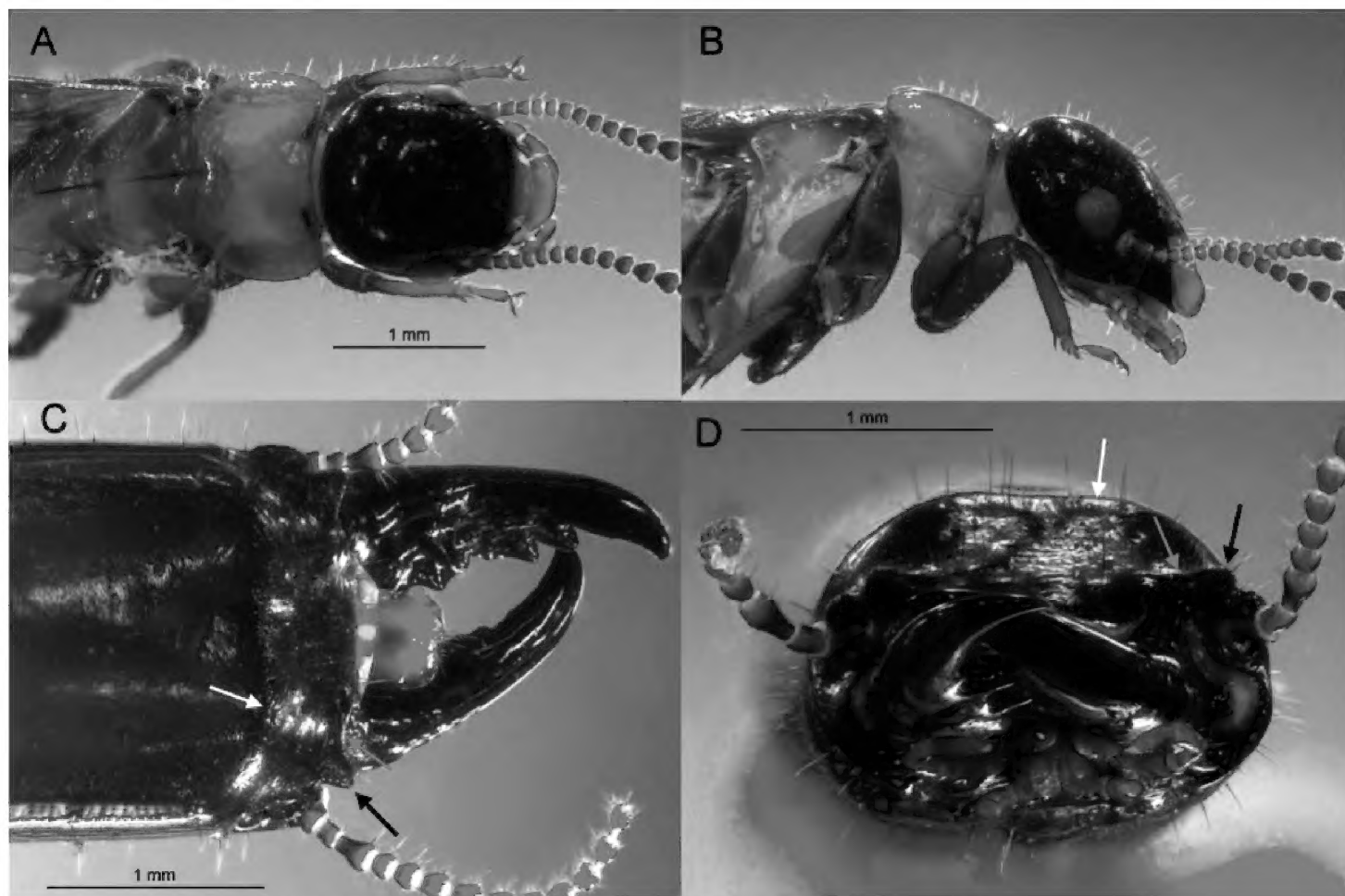


Figure 2. *Rugitermes tinta* sp. nov. **A** Dorsal **B** lateral views of head and thorax of imago **C** dorsal **D** frontal views of anterior soldier head capsule (white arrows mark frontal flange, yellow arrows mark frontolateral ridge, and black arrows mark protuberance of frontolateral ridge).

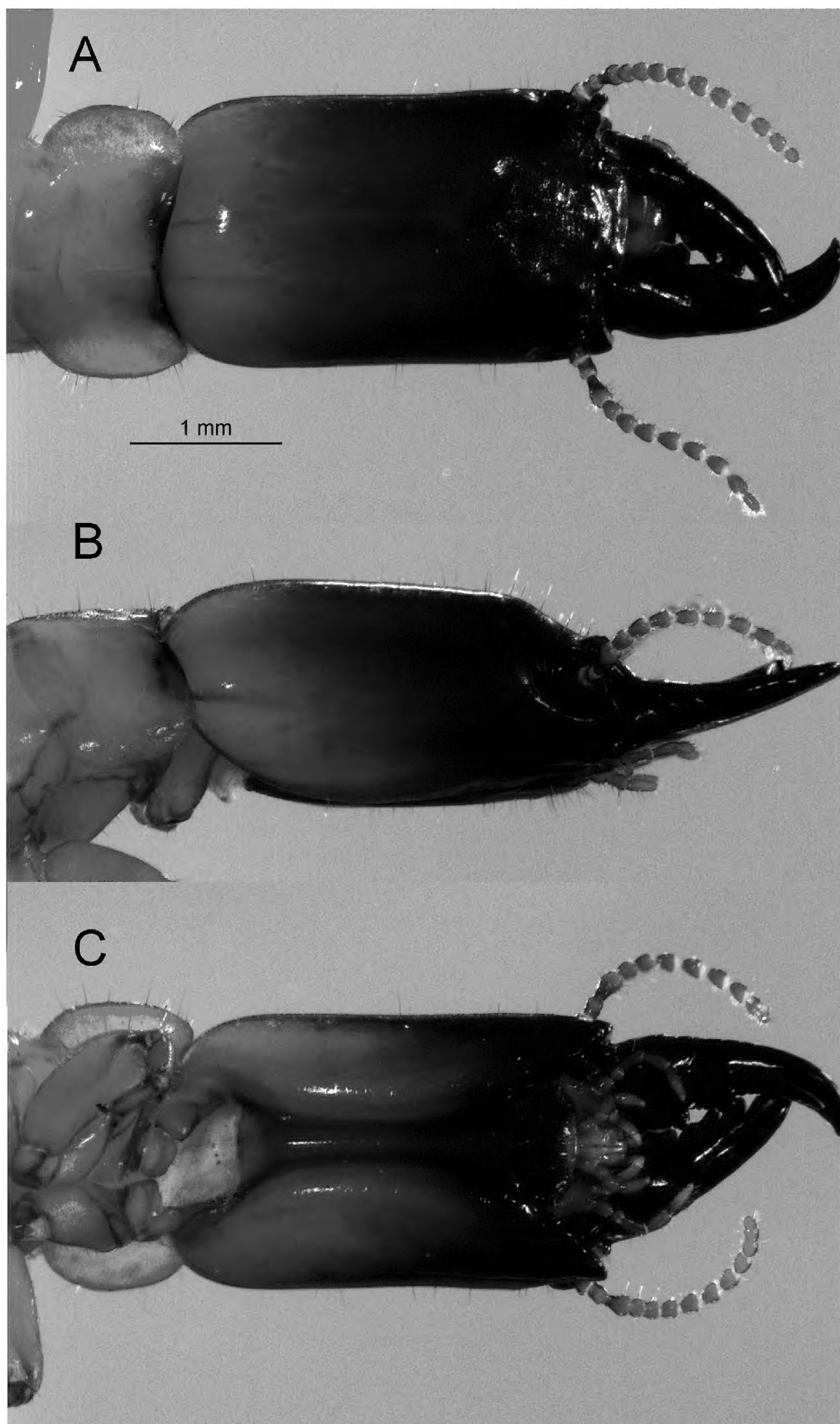


Figure 3. *Rugitermes tinta* sp. nov. soldier head and pronotum. **A** Dorsal **B** lateral **C** ventral view.

head capsule cuticle; ocellus well removed from eye margin. Head vertex and frons not depressed; frons with faint rugosity; covered with dozens of erect setae ca 0.15-mm-long. Pronotum slightly wider than head capsule; anterior margin slightly incised; posterolateral corners evenly rounded, posterior margin narrowly concave. Pronotum pilosity congruent with vertex. Antennae with at least 16 articles, basal article relative lengths $1>2=3>4$. Forewing anterior half as per genus; median vein very short, joins radial 0.9 mm from wing scale. Wing scale covered with about 20 setae of similar length and density as those on head and pronotum. Wing membrane smokey brown, covered with darker nodules. Legs dark brown. Arolium present. Measurements (maximum, mm): head width 1.31, pronotum width 1.43, eye diameter 0.32, ocellus diameter 0.01, and body length 7.9.

Soldier (Figs 2C, D, 3). Head capsule, in dorsal view, dark castaneous brown from posterior margin of postclypeus to posterior one fourth; posterior one fourth grading from dark reddish brown to brownish orange at occiput. In ventral view, head capsule coloration grades gradually from dark castaneous brown to brownish orange with exception of postmentum which remains dark reddish brown at posterior. Pronotum yellowish with reddish interior, in obvious contrast with head capsule coloration. Head capsule long, rectangular; lateral margins very slightly concave in middle, covered with a few setae except at frons where setae are denser. Pronotum much wider than long; with scattered setae, denser along lateral margins; anterior margin weakly incised. In dorsal view, the frontal flange forms a weak hemispherical border surrounding the frons. The frontal flange forms a 30° angle with plane of vertex. Frons finely rugose. In dorsal view (Fig. 2C), frontolateral ridges form shelves on each side of the frons almost in-line with posterior margin of postclypeus. The outer margins of each ridge are adorned with protuberance forming acute angles of ca 65° . In frontal view, the ridges rise slightly at their protuberances; dorsal margins of antennal carinae ("sockets") positioned well below ridges. Eye spots small, concolorous with head capsule. Third antennal article club-shaped, about twice as long as second and fourth articles. Mandibles about half length of head capsule; outside margin of each blade curving gradually, with very slight hump at base. Measurements in mm [mean (range, $N = 6$)]: Head length lateral base of mandibles: 2.83 (2.47–2.99), max. head width 1.72 (1.52–1.90), max. head height with postmentum 1.42 (1.29–1.47), max. pronotum width 1.86 (1.58–2.04), max. pronotum length 0.90 (0.86–0.95), third antennal article length 0.19 (0.18–0.20).

Type material examined. Holotype (soldier). Colombia: Risaralda, Pereira (4.810, -75.695); 1410 meters a.s.l., 11APR1998, J. Navarro, A. Arevalo; two soldiers (one labelled holotype), one damaged female imago University of Florida Termite Collection (UFTC) no. CO919, subsample from Colección Entomológica Forestal Universidad Distrital "Francisco José de Caldas" (CEFUDFJC) no. 009942 of which remains one soldier and three pseudergates.

Other material examined. Colombia: Cundinamarca, Villeta (5.017, -74.467); 842 meters a.s.l., no date, A. Moreno; one soldier and two pseudergates; CEFUDFJC no. 009940. Colombia: Risaralda, Pereira (4.810, -75.695); 1410 meters a.s.l., 11APR1998, J. Navarro, A. Arevalo. Same location; two soldiers, three pseudergates; CEFUDFJC no. 009942.

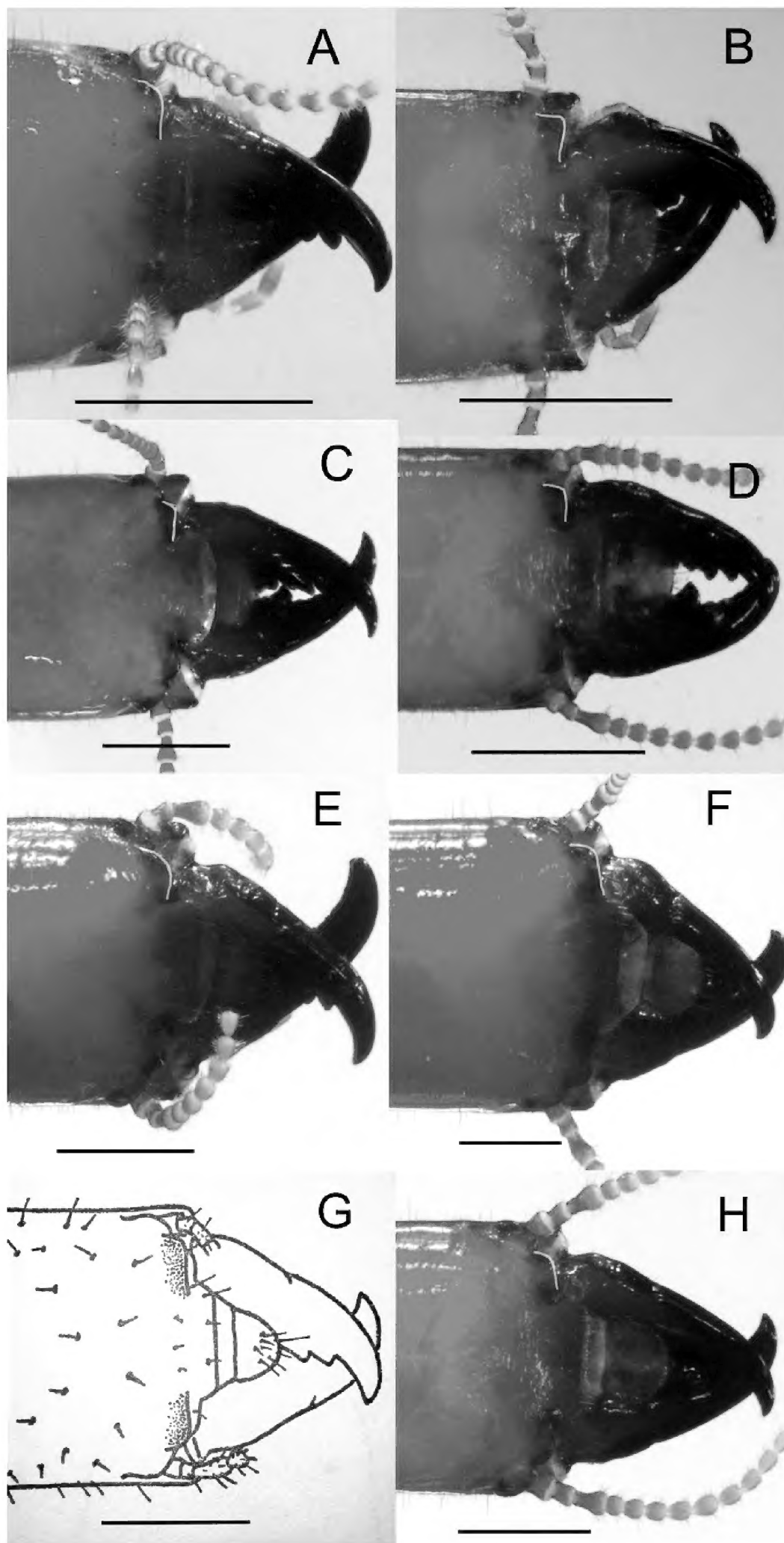


Figure 4. Anteriodorsal views of *Rugitermes* soldier heads from South America. Margins of left frontolateral ridges enhanced. **A** *R. bicolor*, PU946 **B** *R. flavicinctus*, TT88 **C** *R. laticollis*, EC1465 **D** *R. magninotus*, PU1087 **E** *R. occidentalis*, AG380 **F** *R. niger*, AG500 **G** *R. nodulosus* (modified from fig. 14, Krishna 1961) **H** *R. rugosus* PA1186. Accession numbers from UFTC (Scheffrahn 2019b). Scale bars: 1 mm.

Distribution. *Rugitermes tinta* is known from the Cauca River Valley montane ecoregion (Pereira) which has a mesic climate (Olson et al. 2001) and from the higher slopes of the Magdalena River Valley ecoregion (Villeta) which is characterized by more xeric forests (Sánchez-Cuervo et al. 2012).

Etymology. “Tinto” is the Colombian name for plain black coffee which is reminiscent of the dark coloration of the *R. tinta* soldier head capsule. The type locality of *R. tinta*, Pereira, is also in the major coffee growing area of Colombia.

Discussion

Authoritative records of the kalotermitid diversity for Colombia are reported almost entirely from the Caribbean Region (Casalla et al. 2016a, b; Snyder 1925; Krishna and Emerson 1962; Scheffrahn 2019a, b). An Andean termite survey by Parra and Soto (1992) is a remarkable exception as they report ten kalotermitids from this region. Except for *Cryptotermes brevis* (Walker), their generic and specific assignments are mostly incorrect. Furthermore, the drawings by Parra and Soto (1992) do not allow for positive identification below family. Aside from *R. tinta* and *C. brevis*, the only other confirmed kalotermitid from Andean Colombia is *Glyptotermes truncatus* (Krishna & Emerson, 1962).

It is hoped that future termite collecting in Andean Colombia will uncover many new termite species and expand known species distribution records. The Magdalena River Valley recently also yielded a new non-kalomitid termite, *Rhynchotermes armatus* Scheffrahn (2019c).

Acknowledgments

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References

- Casalla R, Scheffrahn R, Korb J (2016a) *Cryptotermes colombianus* a new drywood termite and distribution record of *Cryptotermes* in Colombia. ZooKeys (596): 39–52. <https://doi.org/10.3897/zookeys.596.9080>
- Casalla R, Scheffrahn RH, Korb J (2016b) *Proneotermes macondianus*, a new drywood termite from Colombia and expanded distribution of *Proneotermes* in the Neotropics (Isoptera, Kalotermitidae). ZooKeys (623): 43–60. <https://doi.org/10.3897/zookeys.623.9677>
- Emerson AE (1925) The termites of Kartabo, Bartica District, British Guiana. Zoologica (New York) 6(4): 291–459.

- Hagen HA (1858) Monographie der Termiten. Linnaea Entomologica 12: i–iii + 4–342 + 459. [+ 3 pls]
- Holmgren N (1911) Termitenstudien. 2. Systematik der Termiten. Die Familien Mastotermitidae, Protermitidae und Mesotermitidae. Kungliga Svenska Vetenskaps-Akademiens Handlingar 46(6): 1–86. [+ 6 pls]
- Krishna K (1961) A generic revision and phylogenetic study of the family Kalotermitidae (Isoptera). Bulletin of the American Museum of Natural History 122(4): 303–408.
- Krishna K, Emerson AE (1962) New species of the genus *Glyptotermes* Froggatt from the Papuan, Oriental, Ethiopian, and Neotropical regions (Isoptera, Kalotermitidae). American Museum Novitates 2089: 1–65.
- Krishna K, Grimaldi DA, Krishna V, Engel MS (2013) Treatise on the Isoptera of the world. Vol. 2 Basal Families. American Museum of Natural History Bulletin 377: 201–623. <https://doi.org/10.1206/377.2>
- Light SF (1932) Termites of the Marquesas Islands. Bulletin of the Bernice Pauahi Bishop Museum 98: 73–86. [3 pls]
- Oliveira GMF (1979) *Rugitermes niger* (Isoptera, Kalotermitidae), nova espécie de térmita do sul do Brasil Dusenía 11(1): 9–14.
- Olson DM, Dinerstein E, Wikramanayake ED, Burgess ND, Powell GVN, Underwood EC, D'amico JA, Itoua I, Strand HE, Morrison JC, Colby JL, Allnutt TF, Ricketts TH, Kura Y, Lamoreux JF, Wettengel WW, Hedao P, Kassem KR (2001) Terrestrial ecoregions of the worlds: A new map of life on Earth. Bioscience 51: 933–938. [https://doi.org/10.1641/0006-3568\(2001\)051\[0933:TEOTWA\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2001)051[0933:TEOTWA]2.0.CO;2)
- Parra GV, Soto LH (1992) Aspectos ecologicos de los termites de la region Andina de Colombia. Cespadesia 19 (62–63): 7–45.
- Sánchez-Cuervo AM, Aide TM, Clark ML, Etter A (2012) Land cover change in Colombia: surprising forest recovery trends between 2001 and 2010. PLOS One 7: e43943. <https://doi.org/10.1371/journal.pone.0043943>
- Scheffrahn RH (2015) Global elevational, latitudinal, and climatic limits for termites and the re-description of *Rugitermes laticollis* Snyder (Isoptera: Kalotermitidae) from the Andean Highlands. Sociobiology 62(3): 426–438. <https://doi.org/10.13102/sociobiology.v62i3.793>
- Scheffrahn RH (2019a) Expanded New World distributions of genera in the termite family Kalotermitidae. Sociobiology 66(1): 136–153. <https://doi.org/10.13102/sociobiology.v66i1.3492>
- Scheffrahn RH (2019b) UF Termite database. University of Florida termite collection. <https://www.termitediversity.org/> [Accessed on: 2020-6-10]
- Scheffrahn RH (2019c) *Rhynchotermes armatus*, a new mandibulate nasute termite (Isoptera, Termitidae, Syntermitinae) from Colombia. ZooKeys 892: 135–142. <https://doi.org/10.3897/zookeys.892.38743>
- Silvestri F (1901) Nota preliminare sui Termitidi sud-americani. Bollettino dei Musei di Zoologia ed Anatomia Comparata della Reale Università di Torino 16 (389): 1–8. <https://doi.org/10.5962/bhl.part.26628>
- Snyder TE (1925) New American termites, including a new subgenus. Journal of the Washington Academy of Sciences 15(7): 152–162.
- Snyder TE (1957) A new *Rugitermes* from Bolivia (Isoptera, Kalotermitidae). Proceedings of the Entomological Society of Washington 59(2): 81–82.